

AMATEUR CINE

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SEPT.—NOV., 1944

THE AMATEUR GOES TO AFRICA

By GEORGE H. SEWELL, A.R.P.S.

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AMATEUR CINE

W O R L D

Incorporating "Miniature Camera World"

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GORDON S. MALTHOUSE, Editor

The Old Home Town

NOW that a hopeful anticipation of the end of the war being, if not actually in sight, at least round the next corner, is no longer dismissed peevishly as "wishful thinking," it is now almost possible to write without apologies of filming for the pure fun of it. For the past four years or so, filming just to please oneself was simply not done because of (a) scarcity of stock and multiplicity of restrictions, and (b) the no less potent moral persuasion that it wasn't the thing to do.

One can look forward to the time when one takes one's camera on holiday again, when another reel can be added to the family film history, when one can go out into the highways and byeways with a loaded camera and the hope, which ample experience to the contrary never extinguishes, of something turning up.

But there will be many amateurs no longer content to produce the pleasant little pedestrian pieces they made before the war. The long years when the only contact they had with their hobby was to think about it and dream about it have bred in them a sterner resolve. They want to make a worthwhile film. This does not necessarily mean that they want to use the camera as a sociological or educative instrument—only that they want to make a film that shall really satisfy them; and they realise that it will only do that if it is made with loving care and thoroughness, whatever its subject.

Most of our correspondents who have written us from home and abroad of their plans for the future have firmly made up their minds what to film and are bursting to begin; but some are uncertain and ask for suggestions. One is always diffident of suggesting to the next man what he shall film, and our excuse for pointing out the possibilities of the following subject is that we, personally, are attracted by it—and if a man shall not urge the merits of something he likes and believes in, then what in heaven's name is he to suggest?

It's an obvious enough subject, and strikingly unoriginal—your home town. But

before you pick up your hat and say: "That is where we came in," stop a minute. Your home town is not what it was. The face of it is changed. Its way of life has changed. After the war it will change still more. It will be a worthwhile job to record those changes and, in doing so, get behind the facade and show it not as a collection of streets and open spaces, but as a living organism with a meaning for its existence, and a reason why it should have led that particular existence.

Such a film, therefore, is not made with casual shots of bomb devastation (for one supposes that, after the war, the need for the ban on photographing bomb damage will have passed), angle shots of the scaffolding of new buildings and nicely composed views of picturesque places still, happily, standing. It is not made by showing the life of the town or city from dawn until the extinguishing of the last neon light or the delivery of the milk—fascinating as such a record can be. In parenthesis one might add that it will be a long time before many of us want to get up at dawn again.

Your town is composed of living stones—yes, even those that are now on the rubble heap—which will speak and yield their story only to those who have the patience and the enthusiasm to piece it together. You remember from your schooldays how, if a place-name ends in *cester* it is likely to be Roman, and Saxon if it ends in *ton*. You may not be prepared to delve so far back in the history of your town, and in any case the lack of early remains may render such a search unprofitable.

Even so, although streets may change radically in appearance they very rarely disappear, and the fact that there is now plate glass where once, perhaps, there were half-timbered houses does not invalidate the reason for the direction which the street takes. Again, if there are half-timbered houses over-hanging the roadway they will necessarily call for some shots; but, just

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The Amateur Goes to Africa . . . and becomes a factor in international welfare.

By GEORGE H. SEWELL, A.R.P.S.

IT can be a source of considerable pride that, in the middle of the greatest War in history, this country's schemes for the welfare of its Colonial inhabitants go forward almost unchecked. They are inevitably hindered to no small degree by the exigencies of war, but a more vigorous pursuit of the policies laid down, the adoption of alternative expedients, almost negatives the hindrances encountered.

One of the most important aspects of the main policy is the education of the indigenous inhabitants of the Colonies and Empire to higher standards of existence in which they can enjoy the benefits of better health, better housing, and a more fruitful personal life. Such an edifice can only be built on a basis of personal effort by the native himself, an effort initiated and encouraged by the acquisition of knowledge of such better existence.

It is often glibly said that "Pictures are the Universal Language," but that language, like all others, must be learnt. An ordinary still photograph is entirely meaningless to a large proportion of truly unsophisticated people, and a native who is handed a photograph is quite as likely to hold it upside-down as any other way. On the other hand, movement within the picture makes it readily understandable, and so the cinema is proving to be a most potent instrument for the educational scheme.

The scheme is by no means a recent development, but has been growing for a number of years. Its inception was largely due to the activities of a most enthusiastic amateur cinematographer, who, during his many years as a Colonial officer, used his 16mm. cine camera and projector to record improvements in the country in which he was stationed, and also as a means for the amusement and entertainment of the native population. That man is to-day, most appropriately, in control of the production activities of the Colonial Film Unit, the organisation which exists to produce and distribute appropriate films to East and West Africa and other Colonies.

There is already a most impressive list of films, silent and sound, in both 35mm. and 16mm. form. The sub-standard film is regarded as the most important aspect of the work for a variety of reasons, not the

least of these being smallness of size of the equipment, and portability of the films, combined with safety and absence of fire risk.

There is a fleet of mobile cinema units, each consisting of a high-power 16mm. projector, with its necessary generator plant and sound reproducer and a translucent screen which is erected behind the van for shows. In a number of cases intelligent Africans are entirely in charge of this equipment, the projectionist drivers having proved to be most reliable. The units follow prepared itineraries, and generally have regular circuits. At the end of the prescribed period necessary to cover the circuit, each van returns to its headquarters for servicing of all equipment.

By no means all the shows are given in this way, as some villages have their own cinema huts. These consist of a circular hut of mud construction about 12 feet in diameter, with walls 10 feet high and a conical roof, with the eaves well overlapping the sides. At one side a sort of porchway with slightly splayed sides projects between 4 to 5 feet from the main structure, its inner end being 4 feet wide and with a translucent screen opening, the bottom of which is about 5ft. 6ins. from the floor. When the mobile van arrives, the projector is placed on its stand inside the hut and the audience stands outside. In cases where wheeled transport is impossible, the equipment is made up into head loads and carried into the village.

This hut is regarded as the personal charge of the villagers, and is the source of great pride. In time the original hut will be developed in size and importance, and larger buildings may evolve which will act as civic centres.

The Unit has its own 35mm. production teams, and its own studio in this country. In normal times other 35mm. production units would be moving about the areas for which the films were intended, obtaining suitable local material. The war has entirely deferred such activity. That is where the skilled amateur has come into his own. Throughout the areas concerned there were found to be a number of enthusiastic amateur cinematographers, and these were organised to become part of a large scheme. In many cases they had already amassed a considerable

body of material, which has been brought into the common pool for use in the Colonial Film Unit productions. In all cases these workers are provided with supplies of 16mm. film stock, both black and white and colour, and under direction from the London headquarters are preparing new material. These workers, while all of equal keenness, possess varying degrees of skill, and consequently the films which are submitted also vary in merit. To aid these workers the Unit publishes a monthly magazine called "The Colonial Cinema," which contains notes on methods of film making, and up-to-date information regarding the general activities of the Unit and the new films which are in preparation or available for distribution. In addition, those workers who come to this country on leave are given the opportunity to attend a course on film making which is carried out at the headquarters of the Unit.

All the film material which is sent in is projected and criticised in detail, such criticism being sent out to the worker in the field. Where additional material is required detailed instructions are given.

Editing is carried out at the Headquarters in England, a staff of experts being devoted to this purpose, and titling is also done here. There are one or two exceptions to this practice, in cases where the workers in the field are exceptionally skilled, but the former method is preferred as in such case the editing and forming of the finished film can be under the direct eye of those who are responsible for general policy.

In some cases sound tracks are added but the majority of the material is silent in character. This is often essential because the film may, in the course of only a few weeks, be shown to a number of different audiences each one of which speaks a different dialect. Often, in such cases, the film showing is accompanied by a running commentary delivered by a skilled native narrator.

At present this scheme covers such Colonies as Basutoland, Bechuanaland, Gambia, Gold Coast, Kenya, Nigeria, Northern Rhodesia, Nyasaland, Sierra Leone, Swaziland, Tanganyika, Uganda, Zanzibar. There are over 50 films in the Unit's catalogue, and over 20 New Films designed to show the native what is happening throughout the Empire. Although described as "News Films" these latter reels are by no means ephemeral in character or interest.

Many of the productions aim at showing the native what sort of life the white man leads, and in such a film as "English and African Life" direct comparison is drawn pictorially between the two modes of existence.

To pick at random in the list, "Land and Water" traces the development of ships from the simplest craft to the largest ocean going vessels; "We Want Rubber" endeavours to show the native the importance to the war effort of the rubber which he helps to produce; "Machi Gaba" shows the increasing interest taken by chiefs in Nigeria in the welfare of their people; "Barless Incinerator" shows how to build the device mentioned; "Progress in the Colonies" shows, in colour, how the general standard of living is improving in Kenya; and so on.

Much valuable amateur material has been collected which shows such things as dangers of soil erosion due to wrong methods of farming and cattle rearing, and the advantages of improved methods; the benefits to be gained from improved sanitation; the benefits of the modern veterinary systems introduced into the country; systems of combatting certain prevalent diseases and so on.

In this way the amateur cinematographer is able to make a valuable contribution towards the continuance of one of the most important social developments of our time.

Obituary

The photographic world has suffered a grave loss by the death of Mr. F. J. Mortimer, at the age of 69, through shock arising from injuries sustained through enemy action. As editor of "The Amateur Photographer" for nearly forty years, secretary—or, more accurately, perhaps, father of the London Salon, organiser and judge of innumerable exhibitions and pictorialist of impressive achievement, he had become almost a legendary figure among photographers; and it was fitting, therefore, that his work should have been crowned by the award, in 1942,

of the C.B.E., conferred on him solely for his photographic activities. Photography is the poorer for his passing, but he enriched it as few have been able to do.

Enemy action has also caused the death of Mr. H. H. Blacklock, F.R.P.S., secretary for twenty-three years of the Royal Photographic Society and editor of the Society's Journal. The success of his work is measured by the continued rapid growth of the Society, and his service to photography not the less real and valuable for being unobtrusive.

★ *Beginners and Serious Workers*

By G. WAIN, F.R.P.S.

WHAT was the first thing you shot with your first cine camera? Ten to one it wasn't a thing at all, but a person. For my part, I "shot" my small daughter from every angle—and that includes from behind and below! She was filmed in the arms of her mother, grandmother, relations, friends and neighbours. Relations were also filmed, singly and in groups, males usually in the act of lighting cigarettes, females when gathering flowers, and all with faces bravely turned towards the camera, no matter what was happening to the rest of their bodies. (Few indeed were those who could relax and look natural when the button was pressed and that dreadful whirr began!) No visitor was exempt; into the camera went a film; f/4 for a sunny day, f/2.8 for a dull one; look through the view-finder; jam down the button. Those were all the Rules, apart from the most important one—"Never leave a film half finished. Get it in the post. Then it will be back all the quicker."

It would be absurd to expect a person to go on for long spending money and getting only the mediocre results which the above methods produced, and they were considerably modified as time went on. As for the films, contrary to everybody's expectations (including yours, dear reader), they are now amongst the most valued in all my library. The reasons are as follows.

In an attempt to look upon myself as a "serious worker," I now refuse to shoot a foot of film without first preparing a scenario. I use a meter for exposure, and pay some attention to focussing; I make every shot from a tripod. Rarely do I unbend sufficiently as to film a group of relations, unless it be in a scene connected with the family records. The result is that spontaneous humour has disappeared from my shots, and I get none of those intimate little cameos of those near and dear to me, such as I did as a raw beginner.

Some of the "victims" in those early scenes have altered incredibly; others have passed on. How valuable now are those pieces of film, each with its own associations, each with its memories! I would never attempt to show them to strangers—but to a family gathering at Christmas they are top of the bill!

I remember, too, those "trick" shots, which every amateur has to get out of his system, like sowing one's wild oats! There

was the reverse-motion diver, who would leap backwards out of the water if you would only film him with an inverted camera and splice the resulting film the other way round. He was accompanied by the jug which could be mended without a flaw, the banana on which the peel could be replaced, and the man who could swallow tobacco smoke gulped down from the air. Contemporary with these were the shots of the slow-motion golfer, and the ultra-fast-moving traffic, on which I would never dream of wasting film to-day. But they were good fun while they lasted!

If "serious workers" deign to use any titles in their films at all, these are severely "straight" and plain in style. They have got over the "trick" stuff, and their letters do not caper about all over the place in a variety of bewildering ways. But it was rather jolly to play at that single-picture game, and even if one title took hours to make, what a thrill when it lay revealed in all its full glory before an admiring audience!

In those early days one gave a running commentary throughout a film programme as a matter of course. This is considered a crime by the more serious cinematographer of to-day. But what of it? The family cinema show was a jolly, informal affair, where the main idea was to give pleasure. And I am not sure that to lose that happy, carefree spontaneity, and to become one whose criterion of success is, "Will my stuff go down with an audience of strangers?" is to miss at least a good half of the pleasure of cinematography.

Then again, when it came to the question of arranging the family show, people were piled into the drawing room on a Sunday evening, and had to take pot luck as to whether they shivered or roasted, or even as to whether they had a good view of the screen or not! The whole thing was informal to the nth degree, so very different from the slick presentation I now contrive to put over, with everything cut and dried to the last detail before the audience arrives. Yet the shows are not so rollicking, nor the thanks so effusive, these days. Why is it?

Imagine a member of the audience ten years ago talking to a colleague at the office next morning. . . "Yes, he actually had moving pictures on a screen at home. Taken the film himself, too. He had, really! He showed pictures of all his relations. So funny

(Continued on page 121)

• Points from Letters

"I PROTEST . . ."

Sir,—Much has been written about projector lamps; agreed that they are preposterously expensive, but how do they compare with other running-costs, e.g., film hire? A 500 watt bi-plane lamp has a rated life of 25 hours, but if properly cooled should last nearly twice as long. Even allowing for all wartime extras, this works out at about 1/6d. per hour. Sound-film hire for the same period will average twenty times that figure.

16mm. sound is admittedly far below 35mm. on the average. But the reason is most certainly not any unsurmountable limitation of the gauge. 35mm. will, of course, always have the greater potential for high fidelity, but given properly printed film and properly designed and adjusted reproducing apparatus, 16mm. can give sound quality at least equal to the average 35mm. presentation. But how few films are properly printed!

Carelessness, gross inaccuracy, and unsuitable printing machinery are reflected in a shockingly high proportion of library films. In fact, *sabotage* would scarcely be too harsh a word to apply to the activities of some laboratories.

The projector situation is almost as bad. There has not been a single outfit available in this country of which one could say that *all* the essential sound elements have been well designed and executed. It is fortunately true that most recent models are far in advance of their earlier brothers, but some vital defect in either the scanning system or the amplifier seems inevitable. In addition, the majority of projectors in commission are badly out-dated, and even when properly adjusted are incapable of doing justice to the better films. These are harsh and sweeping allegations, but their truth can scarcely be questioned.

Possibly our manufacturing friends will automatically produce perfect projectors and films for us when more normal conditions return, but one cannot help feeling that the consumer will have to make up his mind to refuse to be tempted by apparently inexpensive products, which use will show to be simply inefficient compromises.

It is to be hoped that growing activity in amateur recording will provide us with a new appreciation of 16mm. sound—but that will depend entirely upon the standards which we amateurs set ourselves!

P.R.B.

EDINBURGH.

[The film printing situation is admittedly a difficult one and is due largely to the call-up and the demands of the Services. Almost every firm has lost some of its key members, in some cases only semi-skilled labour is available, and all the time the pressing demands of the Services are paramount.—EDITOR.]

WELCOME VOICE FROM EAST AFRICA

Sir,—Your autumn issue has just arrived in this almost-forgotten corner of the globe, and I feel I must congratulate you on the amount you still manage to pack into "A.C.W." I must confess, though, that some of your descriptions of home cinemas are making me discontented with my present lot.

I appear, however, to be more fortunate than the majority of your readers in that I am still able to indulge in my hobby. During the operations in Madagascar, I was lucky enough to meet a French amateur who possessed a large hoard of pre-war Pathe ortho negative stock and, with a cameraderie not often encountered, he presented me with some five hundred feet, refusing payment of any sort.

(You couldn't put me in touch with someone with a few reels of 9.5mm. stock to sell, could you?)

The letters you have published regarding shows for the Forces remind me of a unit cinema I ran in 1941. Our equipment was far from elaborate—an "Ace" projector, and a screen constructed of white blotting paper. The unit was a small one, with perhaps a dozen privates at the most. Money was short (as it usually is in this job), but by subscriptions among the unit we were able to give three two-hour shows a week over a period of six months. We were many miles from a cinema, so the old "Ace" proved a godsend, not only to us but to sundry villagers and neighbours in other units who dropped in from time to time.

Musical effects were provided by a friend with a piano-acordion, and fades at the beginning and end of each reel were achieved by the simple means of passing a card in front of the lens. "Daily Mirror" readers supplied us with several good films, and the profits from these shows made up a small subscription for the Red Cross. The projector never once let us down and, though its best days are now far behind it, it waits at home, still in good running order.

(Continued on page 124)

THE OLD HOME TOWN (Continued from page 113)

as necessarily in a film which purports to be more than a series of views, the *reason* for their over-hanging should at least be implied. They were not built that way just for the effect.

It is, indeed, the first floors of houses that speak most eloquently of their age; in a busy street the ground floors will almost certainly have been transformed. So the opposite side of the street will give you the best prospect of its general characteristics, for the salient features of which you will perhaps cross over for detail shots.

In short, then, you must learn something of architecture before you can produce a really good film of your town. You don't have to become a student and spend months

in research. A few good books from your public library will be enough. Then, when you have assimilated the background, you will be in a position to plan the general scene, and then evolve the pattern that the film is to take. It is a pattern which, by linking the present to the past and containing in it the threads of the future, will present a real, meaningful story of a town, as opposed to the haphazard string of shots which too often has to do duty for it. One does not find it easy to recall a single film of this subject, amateur or professional, which aspires to anything more than the latter. Here is a chance for the amateur to lead the field with a theme that is at once topical and enduring.

THE EDITOR



Men of the Lightship

By H. A. V. BULLEID, M.A.

Production ..	G.P.O. Film Unit, Blackheath, March, 1940.
Producer ..	Cavalcanti.
Trade Review ..	Aug. 9th, 1940. Dis- tributed by A.B.F.D.
Release ..	Sept. 16th, 1940.
Length ..	2,256 feet—25 minutes.
Directed by ..	Charles Hasse, G. Taylor.
Second Unit ..	Hugh Gray.
Scenario* ..	S. McAllister.
Montage* ..	Jonah Jones.
Photography ..	Edward Carrick.
Design ..	Ken Cameron.
Sound ..	David Evans.
Dialogue ..	Richard Addinsell.
Conducted by ..	Muir Mathieson.
Recording system ..	R.C.A. Photophone. (Duplex noiseless track)
Players ..	Officers and Men of the Royal Navy and Trinity House, and Len Sharpe.

Available on 902 ft., 16mm., S.M.P.E.—25mins.

*Supervised by David Macdonald.

MEN OF THE LIGHTSHIP is dramatic, well-conceived, and technically sound. It played in about 2,500 U.K. cinemas—unsponsored commercial bookings—and earned much applause: but it cannot stand up to a phase-by-phase comparison with contemporary better-class fiction films.

A mere specific opinion from a film critic (or analyst!) is not of value alone: what matters is his opinion *taken in conjunction* with what might be called his "personal equation" or "critic's constant"—i.e., his known preferences and dislikes. In the clear establishing of this constant lies the strength of many individual critics and the weakness of a panel (such as the British Film Institute Monthly Bulletin reviewers), which tends to be inconsistent. Patient readers will have assessed their constant for the present writer, who thus prefaces his admitted coolness towards documentary films. Many documentaries are of great merit, agreed; but having in mind that they get a spurious dramatic assistance from their "real life" subjects, that they flaunt the purity of film art with their patches of sonorous commentary and their mixtures of fact and fiction, and that much of them is studio-re-enacted and, therefore, fiction rather than genuine documentary realism, one cannot but reflect that the documentary is an easier assignment than the fiction film. Curious, too, that many of the "best" documentaries are sponsored, whereas the ones that from the infancy of cinema paid for themselves are

the travelogues and things about frogs and tadpoles, which had no pretensions about Documentary Film Technique, now so earnestly discussed. I only hope these good people will be able, after the war, to make feature films of sufficient merit to withstand American competition.

The situation is brightened by the appearance of such productions as *Target for To-night*, *Operational Height*, and *Men of the Lightship*—which is of special interest by its quality and realism at a very early stage of the war, before we came to be attuned to the machine guns and assorted bombs, now so integral a part of the roaring forties. Its theme and subject is the grim tragedy of the German bomber attack on the East Dudgeon Lightship in January, 1940, a violation of Code which resulted in the death of the crew after their struggle to reach the coast in their small boat.

This subject was taken up by the G.P.O. Unit (now Crown Film Unit) under Cavalcanti, renowned for *Rien Que Les Heures* and *Film and Reality*. Script supervision and Direction were assigned to David Macdonald, whose previous successes included the briskly efficient *This Man Is News* (Barry K. Barnes), and who had considerable Hollywood experience, including three years as assistant to Cecil B. De Mille on *The Sign of the Cross*, *Cleopatra*, etc. He has since produced *Desert Victory*.

The interiors were carefully re-constructed on rockers at Blackheath; the models were done at Ealing; and the unit went on location to Harwich for the exteriors. Actors were engaged, but the results so horrified Cavalcanti that he sacked them (later, complaint was made that Mr. Macdonald's work had been interrupted by two foreign gentlemen, Mr. Caval and Mr. Canti!!) Correctly, the playing was then assigned to natural types.

The "Morecambe Bay" lightship was used for exteriors at sea, including the bomber attack which was staged with the R.A.F., six camera units being employed. Complete recording equipment (weight 6 tons) was taken out to the lightship, and the effects of the hooter, launching the boat, rowing, etc., were recorded on the spot, in accordance with what is now the policy of the Crown Film Unit in using actual effects in every case.

The unadorned main and credit titles, just discernible through drifting cloud, are admirable in conception and in exactly the right key. The factual theme is stressed by showing the newspaper headlines reporting

the incident. Detail shot of map—repeated in full C.S. for emphasis—establishes the position: mix back to clouds, mix to full L.S. of the lightship, a speck; sympathy is aroused. The commentary explains the Nazi's violation of the traditional code. It should be noted that the visuals are spun out to contain the length of the sound track, which is undesirable. On board the lightship, two of the crew watch the last of an early morning convoy, turn off the fog signals (a nice low-angle detail shot), and discuss their relief, due that day. Dialogue was post-synchronised for the exteriors: quality is good but synchronism variable, though better than has been noted with professional players! Below decks the others are roused . . . the interior L.S. is excellently lit, the roll and pitch characteristic of such craft well reproduced. The skipper shaves, exchanges a "hullo" with his canary—a grand little aside. Long shot discovers the crew at breakfast, comedy is introduced by the anxious owner of "Lightning," apparently lost . . . "Took 'im to bed with you." "So I did"—then in M.S. at his rolled-up hammock he urges "Show a leg, Lightning," and fishes out a tortoise; who in C.S. on the table toys with a bit of bread. Thus is the prevailing atmosphere neatly etched, in these first 150 feet (4 minutes).

At Trinity House (introduced by picture and commentator) the instructions and course for the *Argos*, the relief ship, are given. This sequence, shot on location, is stamped with realism, but is uninspired.

Back at the Lightship, high-angle shot shows man climbing up to lantern; trimming up and polishing is done, with one ingenious multi-reflection shot, and with dialogue laden with an effective echo carefully arranged by the painstaking sound engineer, Ken Cameron.

Full L.S. discovers a mine. Cut to L.S. Lightship. M.S., the skipper laboriously writes up his log, inset C.S. *Crew ready for relief by Argos*. This repetitive emphasis may be a throw-back to the heavy hand of Cecil B. himself, faulty schooling in David Macdonald's early days! Cut back to L.S. mine, M.L.S. Lightship, badly under-exposed M.S. engine being oiled, M.S. mine. All this without sound, but the suspense values are not strong because at the back of one's mind the mine registers as *fiction* and one awaits



Men of the Lightship watch the Destroyer Officers "fixing" the mine.

the fact of the expected Nazi attack. The sound track breaks out with *Lead, Kindly Light* on a concertina, and we see in C.S. hands playing same, then M.S. (well composed) the player then C.S. the music (why?) One man washes up. Another is rug-making, complains bitterly about the "music," and how it made him put in a wrong colour. Lightning's owner stops playing; and is next twisted when they toss for who should empty the slops, "Heads you do, tails I don't," says the other. It is tails . . . "So I don't—you do," and the comic sets off with the pail. The episode of flinging its contents into the wind and getting soaked is age-old and sticky going. One recalls Harold Lloyd doing it so much better when he sought to dispose of 50 copies of an embarrassing paper in *Feet First* (1931, by Clyde Bruckman, with Barbara Kent). However, one must hand it to this player for a finely naturalistic portrayal in by far the most difficult part and in the exacting company of natural types. Also, the last shot is good; gulls laugh jeeringly—the sound is excellently contrived.

Then he sees the mine. Word is passed. The boat is launched with the skipper and two men: he orders a signal round to be fired from their cannon: the shot roars out . . . on board a destroyer it is heard, course is changed. Meanwhile, the three in the boat have the mine in tow. In a beautiful L.S., a rope diagonally across the foreground, the destroyer speeds up towards the little boat. In correct counterpoint, the Lightship is then seen from the destroyer, then in M.S. the Commander megaphones "Hey! Cut it adrift—we'll fix it." Rifles are sent for; the

firing squad lines up: a penny bet is laid on the result: then . . .

- (a) CM.S. (Profile) Lieutenant with binoculars shouts . . . "FIRE."
- (b) L.S. The squad fire.
- (c) L.S. The mine goes up . . . with terrific roar.
- (d) L.S. (Low angle) Lightship crew, on deck and in rigging, cheer . . .
- (e) CM.S. (as a) Lt. lowers his binoculars, remarks in cold amazement . . . "My God, they got it first time."
- (f) L.S. (as c) Continuation of explosion.

. . . and then the audience disperses, the turbulent waters subside (shot c and f continued, a really excellent shot), the destroyer steams away.

Thus, with glimpses of the routine; the dangers; the co-operation and fellowship with the Royal Navy; and the light characteristic comedy; has the director set the stage for the bomber attack. The film is almost exactly half-way through.

A gull circles: two of the crew are on deck: below, someone sings, relief is almost due: the skipper packs, talks to canary: the owner of Lightning is worried, is informed gravely that Lightning was actually seen climbing the mast . . . "Of course tortoises can climb masts." On deck they sight a Jerry plane . . . "Two of 'em—on patrol, I suppose." But machine guns are heard above the roar, gull sweeps from mast, men dive down, completely amazed. Those below hear. The bombers swing back as the skipper comes on deck. In the now familiar shot taken from a Nazi film, machine gunner fires. The skipper is hit: his mind flashes to his wife and to his canary, the montage is good but shot (b) spoils the effect.

- (a) L.S. He clasps his injured arm. 12 frames.
- (b) C.S. Eyes shut, lips tight (shot is splotted black and darkens). 14 frames.
- (c) MC.S. A woman smiles (goes out of focus) 15 frames.



- (d) C.S. Canary in cage, flies off perch. 12 frames.
- (e) FC.S. The skipper's drawn face. 9 frames.
- (f) C.S. Woman: out of focus and out of frame, left. 7 frames.
- (g) C.S. Canary: out of focus and out of frame, left. 9 frames.
- (h) C.S. One hand clasps injured arm. 13 frames.
- (i) L.S. Others dash up, tend him. 282 frames.

The roar of the two bombers fills the sound track. They circle again: detail shot shows machine gun bullets biting the deck while the attacker's shadow passes. This was a stop-motion shot, two turns of a gimlet per bullet. Helped by the sound track, this is good. Reaction Close-ups of the crew are intercut with good effect.

Meanwhile at Trinity House a message comes that another Lightship requires an emergency repair: so the Argos is directed thither at the expense of the East Dudgeon.

Cutting back to the attack, the first sinister tracking show taken from the attacking bomber is really fine. Again we see the airmen, ex Nazi film; bomb doors open, bombs drop with a lighter swish than the now-accepted convention. Two short shots show the explosions on deck, then full L.S. shows smoke sweep across the Lightship: the model is excellent. The bombers approach again: tracking shot, then (pan) L.S. over Lightship. Then . . .

- (a) C.S. Two bombs are released. . . 15 frames.
- (b) C.S. . . . fall away from bomber. 9 frames.
- (c) L.S. Bomber sweeps up and over, pan to smoke drifting. 31 frames.
- (d) L.S. Men run along deck towards camera. 18 frames.
- (e) M.S. Ditto, feet only, 12 frames.
- (f) M.S. Smoke clears, flag mast snaps. . . 19 frames.
- (g) L.S. . . . snaps, breaks away, flag falls . . . 9 frames.
- (h) L.S. . . . into sea. 18 frames.

The bombers swoop again: they make for the boat, delayed slightly whilst Lightning is sought for, then . . .

- (a) L.S. (pan) Bomber drops two more bombs. 22 frames.
- (b) L.S. Bomber roars over. 11 frames.
- (c) L.S. First bomb explosion (1 normal frame, 1 without emulsion, 6 of explosion). 8 frames.
- (d) L.S. Second explosion (1 normal frame, 1 without emulsion, 4 of explosion). 6 frames.
- (e) M.S. (pan) Bomber sweeps over. 8 frames.

This cutting is excellently slick: and the tempo is admirably maintained throughout the pushing off of the little boat: the frantic

Taking cover. Len Sharpe (the only actor) in Cavalcanti's production of Men of the Lightship (G.P.O. Film Unit, 1940, by David Macdonald.)

rowing, in between lying flat as machine gun bullets churn up the sea around them at each new dive: the idly swinging door of their abandoned cabin, the music from the radio, the smoke, twisted metal and washing sea around the doomed Lightship. Then the lantern heels over (cf. Funnel heels over, opening shot of *Lifeboat*, Hitchcock, 1943), and in a split match shot the (model) Lightship heels over while the crew watch grimly from their boat in the foreground.

The Argos looms up in the murky twilight, receives a message flashed from a merchant ship. "She's from Amsterdam—wants to know where the Lightship is" says one officer. "She's not the only one," is the reply.

"Keep rowing, boys, keep rowing," the Skipper urges them on, as the sky darkens. The little boat cuts slowly through the deep. Pools of light wander round the dipping oars. "Keep rowing, boys . . ." The Skipper bales all the time with his uninjured arm. Someone sings . . . "For God's sake put a sock in it." The strain of the long attack, the loss of direction in the small craft, the bitter North Sea cold of January, tell: though the latter elements are hardly even suggested.

Ashore, a girl in a pub bemoans the missed relief, is comforted . . . "They'll be back in the morning, dear."

"Keep rowing . . ." Close-ups of hands on oars are mixed to Close-ups of the men, effectively: well lit, in the black night. One shouts, attempts to jump over: is properly dealt with by the skipper. "Keep rowing." The repetition is effective. The music swells in dramatically. Sunrise finds them all asprawl, exhausted from exposure, a dramatic shot, the photography of misty texture. They sight land. Too weak to help themselves they are flung out by the breakers: the overturned boat crashes



The last phase of the bomber attack. The crew in the lifeboat are taking what cover they can against machine gun bullets.

down. The long shots are grimly effective, a mighty wave almost filling the frame.

L.S. of a Lightship leaving harbour is accompanied by the commentator's "On January 31st a new Light Vessel is towed out to the East Dudgeon station . . ." "The Men of the East Dudgeon died . . . on the sands of the East Coast. Their story is only one episode in a war of untold horror. The Nazis must be stopped . . ." The last long shot down the bare sea edge with the overturned boat and slumped bodies is grimly effective, though much enhanced in horror by the statement and knowledge that it is grim fact. Whether it is in entirely good taste to mix fictional characters with a true story is debatable. Here we merely assess the film, and have seen how ably the Unit handled a difficult subject, the montage, sound, script, design and direction being of high standard. The photography is a patchy mixture of news-reel quality, with touches that are full of promise. Dialogue and music are admirable.

In describing this documentary we have described the fate of some of our countrymen; and to their memory we would respectfully dedicate this short account.

BEGINNERS AND SERIOUS WORKERS (Continued from page 116)

they brought the house down! Oh, no, they weren't supposed to be funny! They just were! It was great!"

What does he say these days? . . . "Saw old So-and-So's latest efforts last night. He must be well off, trying to imitate the Odeon with his curtains and coloured lights and music! He wanted our impressions of his latest documentary. It was all about a weaving machine, or something. His stuff's

too highbrow these days. But I did see a good one of his once. Kids playing with a dog on the beach, in colour. Marvellous!"

You see, in straining after a gnat one is apt sometimes to swallow a camel. The moral from all this is, take up the hobby for relaxation and pleasure. Don't take it too seriously, or at least, mix it. For goodness sake, don't let the tail wag the dog!

"DO IT YOURSELF!"

practical ideas for the handyman

THE ULTRA CLOSE-UP AND FINDER PARALLAX

In each issue our contributor supplies worth-while ideas: things to make and things to do. Suggestions for gadgets are welcomed.

By G. A. GAULD, B.Sc.

ALL popular makes of cine cameras employ view finders located either above the lens, or to one side, or at some intermediate position. Consequently, since the two axes must necessarily be separated by an inch or more, the respective images cannot be identical at all distances. The finder is usually set to include the same field as that covered by the lens at "infinity" as for all practical purposes, the variation is negligible down to a distance of five or six feet. At lesser distances the difference becomes progressively worse, until at the ultra close-up range of eighteen inches the error may be as much as fifty per cent.

Cameras in the luxury class have always been provided with a means of compensating for finder parallax and of recent years the same facility has appeared on the popular makes, either in the form of a sliding eyepiece to the finder, or two or three lines scribed on the front glass of the finder which denote the cut off limits at specified distances. Nevertheless, many cameras have been made and, doubtless, will be made, without any such device. It is our purpose to discuss several simple ways of overcoming the difficulty, particularly at very short ranges of inches, rather than feet, when the compensating devices even when fitted do not usually apply.

In the first place, it is a good plan to check up on the finder accuracy at "infinity." Since the finder is usually positioned by fixing devices which are part of the camera case and as the lens and gate mounting may be independent, unless an optical check is made after assembly, the possibility of an error is far from remote. One very popular make of 9.5 mm. camera of which I have personal knowledge suffered from this trouble, although the camera otherwise was well made.

Before any form of check can be carried out some means of observing the lens image in the gate must be devised. I do not intend to go into details here but, generally speaking, if the pressure plate is removed and a piece of tissue paper cut to the same width as the film is inserted in the gate, with the lens set to its maximum stop, a perfectly good image is obtained and is clearly seen if the cameraman will employ the old fashioned focussing cloth to keep out external light. Although

exact focussing is not important for our purpose, it is better to keep the tissue paper in the film plane, so that users of magazine loading cameras will have to mount the tissue paper on a thin card frame to pack it out from the true camera gate and bring the paper into the same plane as the film when it occupies the magazine gate.

To check the "infinity" setting, pick some well defined horizontal object, such as the roof of a house against the sky. Bring it to coincide with the top of the gate on the camera image, then compare the position as seen through the finder. Repeat the process for the bottom of the gate, then check the side limits by sighting on a telegraph pole against the sky. If there is an appreciable error little can be done about it, as it would mean structural alterations to the camera. However, it is as well to know the position and if the error is serious the finder can, at least, be masked and any "surplus" portion of the view eliminated.

There are many ways of dealing with short range parallax, and perhaps one of the simplest and most useful is by means of a set of cards similar to the one illustrated in Fig. 2. The camera is set up at the end of a table, as shown in Fig. 1, and some form of stand rigged up to which suitable sheets of stout drawing paper may be pinned. The stand is then set up at a predetermined distance, for example 30 inches. The help of a friend is recruited, and he is asked to hold a pencil vertically against the paper and move it as directed by the cameraman until its image as seen in the camera gate coincides with one side of the gate. This position is marked on the paper. The other three limits are marked in a similar way, so that a rectangle covering the field of view as "seen" by the camera lens may be drawn. This is shown in full line in Fig. 2. The same procedure is followed using the finder and, depending upon the relative positions of finder and

camera lens, a second rectangle will be obtained, as shown in the dotted line, Fig. 2. To complete the card, cut out the first rectangle and mark the appropriate distance to which the card refers in inches.

To use it, place the card immediately in front of the object to be photographed at the exact distance for which it applies, and centre the object in the rectangular opening. Next, set up the camera so that the finder image covers the dotted line rectangle. It is obvious that, under these conditions, the object can be accurately centred in the camera gate, and can be "shot" without any fear that a vital portion may be cut off by reason of finder parallax.

A more mobile extension of this principle is shown in Fig. 3. A wooden baseboard some three feet long and about two inches wide by half an inch thick is mounted on the point of balance on the tripod head. A suitable socket is easily made by soldering a $\frac{1}{4}$ " Whit. nut to a brass plate drilled $\frac{1}{4}$ ", with three additional countersunk holes for fixing screws. A $\frac{1}{4}$ " hole is drilled at one end of the baseboard, and the camera fitted by inserting a $\frac{1}{4}$ " Whit. bolt through the hole and tightening up with a nut—a method I have shown in detail in these pages many times before. Chocks, not shown, are glued round the camera so that it will always drop into the same position relative to the baseboard when mounted. At the other end of the baseboard a light wire frame is rigged up to mark the limits of the camera field, and corresponds to the rectangular hole in the card already described.

The gadget is used in a similar way but, as it is intended for use at distances of over three feet, the positioning of the object as far as distance is concerned is less vital. The object in this case, however, is viewed directly through the wire frame, the cameraman placing his eye at the back of the camera and on a level with the lens. An inch between eye and lens axes on the base of three feet to the wire frame will only produce an inch of error in the object position if the object is three feet away from the frame. Normally it will be close to the frame and the error negligible. I have often used this gadget in taking full face close-ups of children.

An ingenious application of this same principle as applied to very short ranges of twelve to eighteen inches is shown in Fig. 4. The frame in this case is U-shaped, so that it

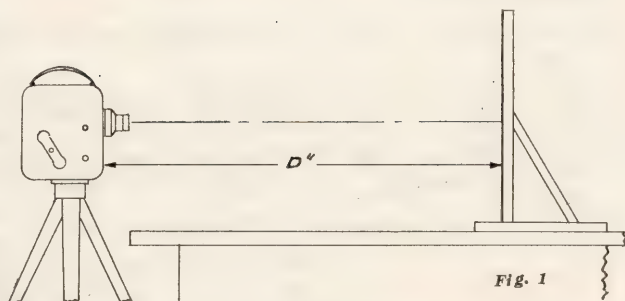


Fig. 1

may be tucked up under the object to be photographed. In use, the gadget is held in the right hand by the pistol grip and the forward end steadied by the left hand. A trigger is rigged to control the starter

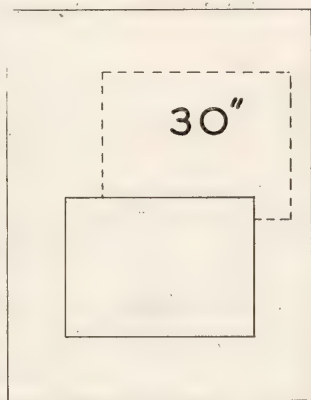


Fig. 2

button on the camera on the lines shown. It is not possible to give details because there are so many varieties in the designs of starter buttons. I have no doubt, however, that any reader who is interested in the idea will be able to design a suitable action for himself. A point to note is the double duty performed by the pistol grip. It acts as the camera mount as well. The detail shows how this is done by means of a Whit. $\frac{1}{4}$ " screw and brass plate with fixing screws. Again wooden chocks, not shown, are glued to the baseboard round the camera to locate it in alignment with the frame each time it is mounted. This gadget is extremely mobile, and a common application is its use for filming the larger insects, such as butterflies and bees, on garden flowers in summer.

Some of my newer and younger readers, who may only possess fixed focus cameras, will be thinking that there is little in this article for them. However, I would remind them, if they do not already know, that close-ups with a fixed focus camera are quite simple if a "portrait" attachment is used. These auxiliary lenses will not be available from

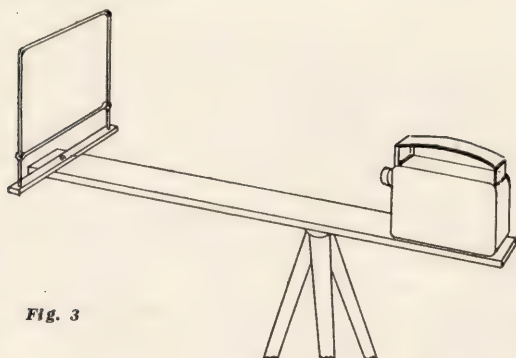


Fig. 3

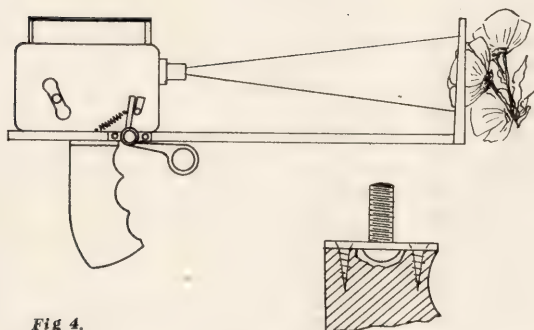


Fig. 4.

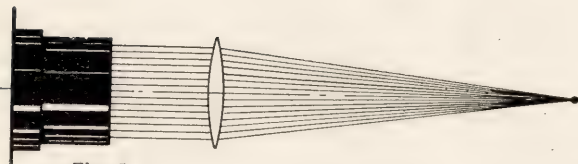


Fig. 5

photographic dealers at the present time, but ordinary spectacle lenses make an excellent substitute. A visit to an optician may produce several useful lenses of the simple double convex type from his "scrap box," or a few may still be found at the sixpenny stores.

The principle of operation is shown in Fig. 5. The blob represents the object set at the focal point of the lens. Since the focal point is that point at which parallel rays from "infinity" coincide after passing through the lens, it follows that rays emanating from the object set at the focal point and passing through the lens will emerge parallel to each other, just as if they had come from "infinity." Thus, as the camera lens will have been focussed to an "infinity" setting, the object in front of the supplementary lens will be sharply focussed in the gate.

If the whole frame is to be properly filled with a picture of the chosen object, the supplementary lens must be brought close to the camera lens. In the position shown in Fig. 5, the lens itself would probably show as a blurred circle near the outer limits of the picture.

Since the auxiliary lens is uncorrected, some falling off of focus may be expected towards the outer limits of the picture, and possibly some slight colour aberration. Down to a distance of twelve inches or so, however, it will not be sufficient to spoil the picture, and at distances over two or three feet the effect will be negligible, since a supplementary lens for this range will be very thin indeed.

WELCOME VOICE from EAST AFRICA—(Continued from page 117)

Re the "Famous Library Films" series, please don't concentrate too much on the modern films. They get plenty of publicity, often out of all proportion to their quality, whereas the older films generally do merit honourable mention. In my present circumstances, this series is the feature I most enjoy. I wish, however, that more of these films were included in the Pathe library.

An interesting discovery I have made out here is that of the French edition of "Pathe Gazette." This consists of a 30 foot reel, published fortnightly, and retailing at 10 francs. Surely something of this sort is overdue in Britain? I, for one, cannot afford to buy a 300 foot newsreel every month, but the cost of a

couple of thirty or sixty foot reels would not be noticed. Newsreel shots are frequently useful for "background" purposes, but I do not fancy buying three hundred feet in order to use two or three.

Very shortly now, my copy of "A.C.W." will be resuming its travels, as I have discovered one or two enthusiasts (and made one convert) who, although separated by several hundreds of miles, are yet united in their love of this particular game.

Well, here's to the next "Ten Best" show, and may we all be there to enjoy it.

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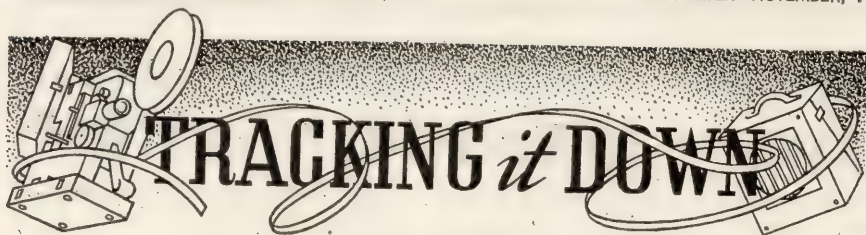
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Secretary: C. LESLIE THOMSON, B.Sc.

Secretary's Report

AFTER the war anyone owning a radio and a cine-camera will be able to build up his own stock of talking films like a snapshot album." This is how one newspaper represents a report issued by the British Institute of Radio Engineers. The implication is that these two pieces of apparatus, presumably plus some inexpensive gadget, will perform all the functions of a complete recording laboratory so effectively that any "snapshooter" can get good results. Probably no reader of T.I.D. is misled by the newspaperman's optimism, but it might be as well to point out why such statements are without real justification.

It is true that the household radio contains an amplifier which could handle talkie sound. It is also true that a cine camera—and projector—can take and show the picture part of a talkie. But there the matter practically ends. The complexity of the apparatus required for synchronised sound recording is in strong contrast to the simplicity of the picture camera. The single-film system, which is the simplest and least expensive method, is of limited application. The "newsreel" camera, which records the voice of the operator at the time of shooting, offers little—beyond novelty—over a *viva voce* commentary by the same person at the time of showing (and probably with better-chosen words). Yet the mechanism of even so simple a recording is unquestionably complex, and if one wishes to record the voice of the person in the picture, additional amplifying gear is required. Doubtless some now-secret compact and sensitive recording-gear will make civilian appearance after the war, but the fundamental requirements of sound-film recording cannot be met by this alone. The newsreel camera may resemble the silent camera externally, but there are many differences in the construction—really silent and uniform-speed running is a refinement which is not cheaply gained.

With twin-film recording, which is essential

for anything more than primitive "snaps," and really the more workable system in all ways, there is little reason for expecting that the sound-recorder can be produced at low cost. Indeed, if existing practice is any guide, we may expect it to be considerably dearer than a picture-camera of similar mechanical and optical quality.

Many readers have first-hand knowledge of the problems met in converting a silent projector to sound, and will be duly sceptical of the glittering prospect, but on the projection side our reporter is probably on firmer ground. Even before the war complete sound projectors cost only about double the price of a corresponding silent machine. (Is the average non-technical individual likely, then, to encumber himself with the complications and compromises inevitable when one combines "half-a-talkie" with "half-a-radio"?) But just as many people use radios, while few own transmitting stations, so the easy availability of a sound projector does not imply popularity of recording-gear. On the other hand, it seems reasonable to expect that recording studios will become numerous and relatively inexpensive, so that the man-in-the-street can have sound films made of himself and his family. But that is not quite the same as being able to make his very own snapshots. Possibly the man who now makes cine films will find that he can afford a simple sound camera and projector—but that his existing equipment and radio should be adapted to the purpose is highly improbable.

8 mm. S.O.F.

Many readers have asked for more details than given in the brief but arresting mention of 8mm. S.O.F. which appeared in a letter in the December, '43, "A.C.W." A more recent report, from a different source, throws a rather less rosy light on the subject. It is quite obvious from this that a good deal of development will be required before the gauge can become a commercial possibility.

With present standards of film resolution and processing, the highest frequency which could be effectively recorded is in the region of 4,000 cycles per second, and this only under exceptionally favourable conditions. Taking typical sub-standard practice as our index, it is likely that 2,500 c/s. is nearer the mark. This upper limit is barely sufficient for intelligible speech, and inadequate for balanced music. The problems of obtaining a sufficiently fine scan of reasonable intensity on so small a track should be capable of solution, although here again current practice suggests that the working limit with existing methods is nearly reached. Bearing in mind that gloomy prophets are usually proved wrong, we look forward to hearing of further developments, but would be a little shy of promising any immediate blossoming-forth of 8mm. sound-on-film.

One of the most interesting items in the report is that all the experimentation has been carried out by one amateur, using entirely home-made apparatus—reduction printers included! Some idea of the immensity of his task may be gained from the statement that he used "30,000 feet (of 8mm. film) before any intelligible sound was produced."

While this is a little wholesale for most of us, it is but another confirmation that the informed enthusiast can readily carry out operations considered quite impossible by the average "snapshooter." And almost any snapshooter can become an informed enthusiast if he is sufficiently interested. In most branches of our hobby, financial difficulties are greatly minimised by a modicum of skill plus some basic information. S.O.F. recording is no exception, and many of us hope to tackle synchronised film-making after the war—although on a less ambitious scale than our colleague above! In preparation for such activity, we would strongly recommend a study of Mr. Roe's excellent little survey: "Elements of S.O.F. Recording." This is packed full of practical details and suggestions, and is available in the form of a T.I.D. Note. Already we have received many warm appreciations of this, the first work to collect and integrate the processes and techniques of amateur recording. (Those more interested in the possibilities of disc recording are referred to the book review elsewhere in this issue.)

Another Note which has been well received is Philip Jenkins' newest contribution—"Intermittent"—which we expected would appeal only to a few advanced workers. Its popularity suggests that there is a growing awareness of the importance of high-grade mechanisms in sound work. Applications for earlier Notes are still pleasingly numerous, and in particular Mr. Jenkins' "Sound

Tracks and their Faults" has been in such heavy demand that four complete new copies, including photographic reproductions of the film specimens, have had to be prepared. "Effective Presentation," by the same energetic writer, is kept busy, and the importance of its message is underlined by a correspondent who despairingly asks: "Why do sub-standard projectionists persist in presenting such poor showmanship in their performances? Is it lack of interest, or lack of knowledge? I have often wondered." If it is the latter, "Eff. Pres." is the answer!

"Dual-gauge Soundhead" is a detailed and fully illustrated account of a highly successful original design, and contains much information applicable to nearly all conversions. Any of these may be borrowed on application, enclosing 4d. in stamps for each. One week is the limit of loan under normal circumstances, and we would again like to point out that, although copyright is reserved on all materials and illustrations in these Notes, we do not object to any bona fide amateur making a copy for his own use, so long as the originals are not defaced in any way. Apart from the Notes, the information in which is vouched for by members of the T.I.D. Board, we have several brief descriptions of successful conversions, contributed by readers. These are normally lent to enquirers whose machine happens to be of the same type. Three such reports which have come in recently are outstanding in their own way, and photographs of them are reproduced here.

Amateur Conversions

Fig. 1 shows what must surely be the most improbable of all conversions—an outfit based on the original Pathe "Home Movie"! Although one might have doubts as to the suitability of this machine for the purpose, one cannot question the ingenuity which has been expended on it. Although not discernible in the small photo, the finish is exceptionally fine. Of particular interest is the way in which the film has been transferred from the interior of the original take-up chamber to the plane of the soundhead by means of a complete circle loop. This also serves to isolate intermittent movement from the sound drum very effectively. Mr. Geissler informs us that his machine is in almost constant use, giving shows in aid of the Red Cross, which would indicate that satisfactory quality and reliability have been secured. Mr. Geissler has also sent us the circuit of the AC/DC amplifier he uses, employing British-type valves.

Fig. 2 shows a rather different class of machine, and is the Western-Electric converted from sound-on-disc to S.O.F., recently

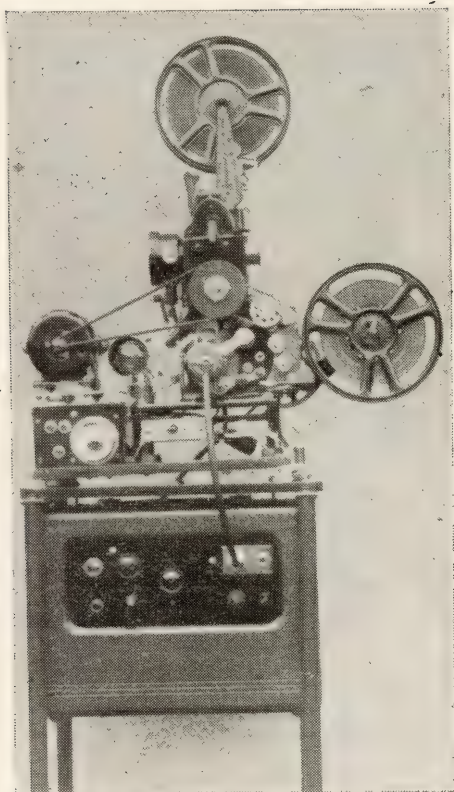


Fig. 1. Mr. Geissler's sound conversion of a Baby Pathe Projector.

mentioned in T.I.D. Even in half-tone reproduction the clean design and careful workmanship will be evident. The mechanism is all substantially proportioned, and is intended for heavy duty combined with a high degree of refinement. For instance, a jockey-roller is provided between the scanning-drum and the drive-sprocket, and is actuated by an external control. This allows the operator to adjust exactly the synchrony between sound and picture during projection—a compensation which is unfortunately required by some films. Another feature which Lieut.-Commander Heywood has introduced is a rotating-drum scanner, closely followed by the flywheel-smoothing drum—an arrangement which has several constructional advantages. A relatively heavy shunt-wound motor is fitted, and provides steady speed while at the same time allowing the operator to select a speed higher or lower than standard if he so desires.

(We cannot help thinking of one popular nature-study commentator who might be immensely improved by a fractional slowing-up!)

The compactness and rigidity are other points which we would particularly commend to the prospective conversionist, apart from the accuracy and excellent finish of the parts.

Thirdly, an example of a conversion which is notable for its simplicity and neatness. Mr. Holmes' Pathe H, shown in Fig. 3, is fitted with a panel behind the lamphouse, on which are fitted the exciter-lamp in its housing, the optical system, the scanning-drum enclosing the cell, a heavy flywheel on ball-bearings, and the guide-rollers. Although its appearance might suggest a closed film-path, the film can actually be threaded or removed part-way through its run, as a loop is simply passed through between lamp-house and motor to the soundhead.

Exciter Lamps

We have received so many questions on the subject of exciter lamps and their power supplies, and been offered so much conflicting opinion about their characteristics, that we have been persuaded to undertake a series of laboratory tests. These experiments were intended to settle such controversial points as: "What is the actual amount of light-ripple in exciters run off A.C.?" "Does not over-running the exciter reduce the hum?" "Isn't the hum much less for high-power lamps than for the smaller ones—in other words, isn't the wattage more important than the amperage?" Following these experiments, a set of practical tests was made to investigate the possibilities of the various hum-free systems—with particular reference to the present shortage of many components. From these findings, useful details, figures and dimensions for a very simple and effective supply unit have been derived. Also, some hitherto inaccessible facts about rectifier systems are reported.

Ripple, or Hum-Content

The determination of the light-fluctuation in various lamps required rather more elaborate apparatus than was anticipated. It consisted of a cathode-ray oscilloscope in conjunction with a photo-electric cell and suitable amplifier. The uniformity of the test conditions was under constant check by means of a sensitive microammeter in the cell circuit and accurate volt and ampere meters in the lamp circuit. The findings of this experiment are recorded graphically in Fig. 4. It will be seen that the ripple content

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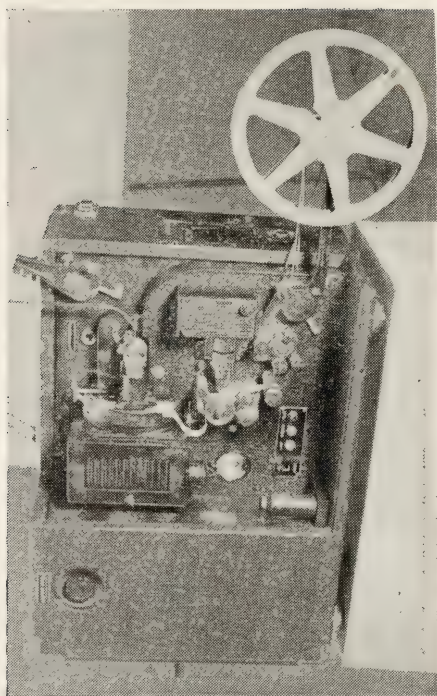


Fig. 2. Western-Electric 16 mm., converted to S.O.F. by Lieut-Commander Heywood.

falls rapidly with increasing amperage (thickness) of the filament, to about 2 amps. Beyond this the improvement is relatively slight. (The two points near the base-line indicate the ripple-content of two exciters on rectified current. They indicate the very marked advance available by this system, which is discussed later.)

Not all the lamps tested, however, fell truly on the graph-curve, and some of the exceptions are interesting. Most noticeable was the behaviour of coiled-coil filaments—found in many medium-power projector lamps. These showed almost one quarter less ripple than straight-coil filaments of the same rating; the compact mass obviously has greater heat-retention than the open construction. A corresponding difference was found between normal filaments and the very widely-spaced spiral of "festoon" bulbs. Gas-filled bulbs showed more ripple than vacuum, but this may have been due to higher temperature rather than to increased cooling of the former.

The effect of varying the current in a given filament was observed, and one claim was rudely shattered—far from reducing the hum,

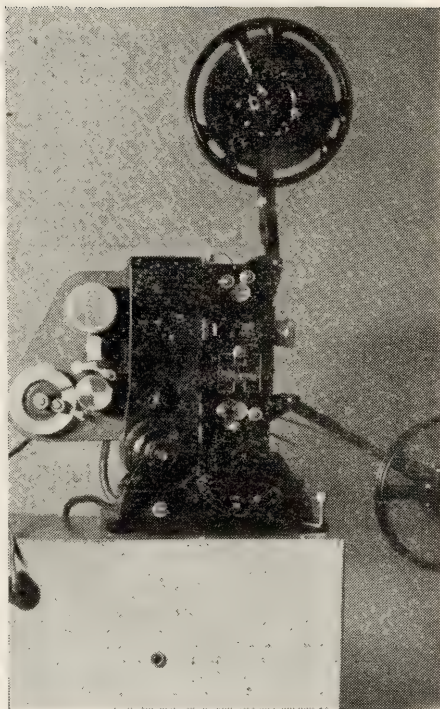


Fig. 3. Soundhead fitted to Mr. Holmes' Pathe H.

over-running increased the ripple (proportional to the total light, of course). Thus a 6-volt 2-ampere lamp showed 6% ripple on 5 volts, rising to 6.5% on normal current, and reaching 7% on 7 volts. Rather unexpectedly, no variation could be detected on interposing various colour-filters between lamp and cell.

Finally, no appreciable variation was found in the ripple of filaments of the same amperage but of different voltages (e.g., a 100 volt 200 watt lamp showed the same proportion as a 6 volt 12 watt bulb).

So far as these findings are directly applicable to exciter lamps, they may be summarised thus:—The minimum hum is to be expected from a lamp having a closely-wound filament, not subjected to excess voltage, of at least 2 amperes rating, and of a voltage which may be as low as is otherwise convenient. Even at best, one may not expect the ripple to be much less than 5% of the total light, using a lamp fed directly off 50-cycle A.C.

This confirms suggestions in previous T.I.D.'s, that the background hum when using low-power exciters on A.C. is excessive,



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and that even the standard 4-ampere exciter is guilty of considerable noisiness. Since 50-cycle is the easiest to provide, it is not surprising that various devices have been tried in the effort to reduce the hum. Designing the amplifier to give a sharp cut-off just above 100 cycles is one rather crude method. The hum is practically eliminated, but with it disappear the fundamental notes of music and of the male voice. The resultant sound is unsatisfactory and lacking in "body." Also, although the 100-cycle note is absent, its effect remains evident as what is familiar to the radio-man as "modulation hum."

A more refined method consists of imposing a varying voltage on the cell, so timed that it increases as the exciter brilliance falls, and vice versa. The net result is an approximation to hum-free background, with no loss in the bass. However, the exact matching of phase and amplitude raises considerable practical difficulties for the amateur.

High-ampere filaments, as we have seen, are disappointing in that their increased smoothness is relatively slight. Thus we find that, although 7.5 ampere or heavier filaments have been freely used, the 4-ampere lamp is accepted as standard in most professional outfits. Even this 32-watt lamp is distinctly on the hot side for sub-standard outfits, but some constructors have used even more powerful lamps, despite the fact that they require forced cooling and are undeniably clumsy.

Hum-Free Power Supplies

The best answer to the problem is to provide the exciter with current which contains either no fluctuation, or variation at so high a frequency that it is beyond the audible range. (In the latter case, the thermal capacity of any normal exciter is more than sufficient to "iron out" any ripple in the emitted light, so that the silencing is doubly effective.) In portable apparatus, the use of such feeds may not be practicable for the higher-power exciters, but it should be remembered that efficient 3 or 6 watt lamps can produce practically as intense scanning-beams as lamps of five or ten times the power. Direct current is an obvious source of ripple-free power, and this may be provided in several ways: 1. From accumulators—simple and reliable, but cumbersome. 2. By a small generator, in which a motor of either the universal or induction type drives a D.C. dynamo, which is preferably of the permanent-magnet type. With a properly designed dynamo—one having a multi-section rotor—the ripple is so small as to have almost negligible effect, and if necessary can be eliminated entirely by a choke. (Small toy dynamos are useless for this purpose,

as their 2- or 3-segment rotors produce a strongly pulsating current.) 3. From a rectifier with smoothing. Mercury rectifiers are used in 35mm. equipment, but for amateur use the more compact "metal" rectifier is required. This may be either of the copper-oxide or selenium type, and smoothing is provided by a choke and one or two high-capacity condensers.

At the moment suitable rectifiers and condensers are scarce, but can be found by the very patient. The circuit is given in Fig. 7, and the following points should be observed:—The full benefit will only be obtained with condensers of high capacity, and for a 1 ampere exciter two 1,000 mfd. electrolytics are desirable, while for 2 to 4 amp exciters 2,000 mfd. condensers are more satisfactory. Failing these values, the higher capacity should be on the lamp side of the choke (e.g., at a pinch, a 500 mfd. condenser will serve between rectifier and choke). The rated voltage of the condensers should be at least double that of the lamp—12 v. working for a 6 volt exciter; 25 v. wkg. for 8 or 12. A good safety margin is particularly desirable in the condenser immediately following the rectifier.

Smoothing-Choke Construction

The choke effects most of the smoothing, and even without condensers can reduce the ripple to only one quarter of that on raw A.C. With the condensers in circuit the ripple is further reduced to about one twentieth or less of the unsmoothed figure. One may be lucky enough to find a ready-made choke in a radio shop; "low tension" is the type, and its resistance should be 1 ohm or less. More likely, the amateur will have to build his own, and if a suitable core is available this is quite a simple process. An old loudspeaker transformer is a very suitable basis—especially if it has a moulded or fibre bobbin. First, dismantle the outer clamp, then withdraw the core, which consists of numerous leaves of iron, from the bobbin. Some care may be required in extracting the first leaf, but the rest should slip out easily. The pieces will be found to consist of interleaved "E" and "I" shapes. Next, remove the old windings from the bobbin—unwinding the thick wire, and cutting the fine away with a penknife. These cores, which usually measure $\frac{3}{4}$ " x $\frac{3}{4}$ " in their central part (i.e., the cross-section of the hole in the bobbin) are suitable for currents up to 2 amperes. For 3 or 4 amps—or extra efficiency on lower currents—a heavier core is required. Something in the nature of an old wireless H.T. choke, with a core of at least $\frac{3}{8}$ " x $\frac{3}{8}$ " section is wanted.

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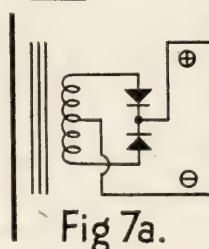
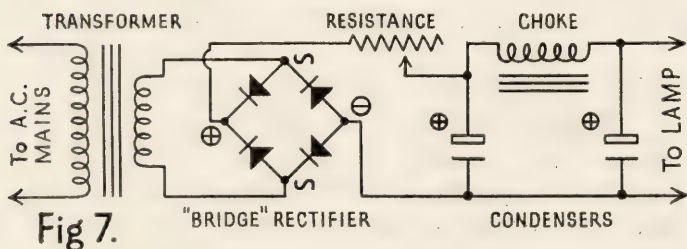
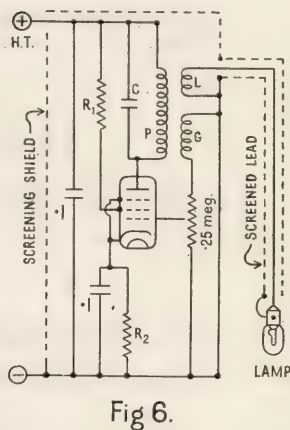
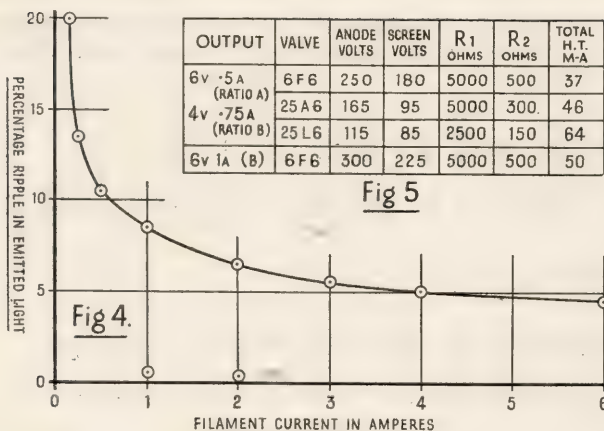


Fig. 4. Curve showing proportion of exciter-hum with various types of filament.

Fig. 5. Details of values in Fig. 6 for different types of valve and exciter.

Fig. 7a. Alternative arrangement for a full-wave rectifier, not of the bridge type.

Fig. 6. Circuit of Valve Oscillator unit.

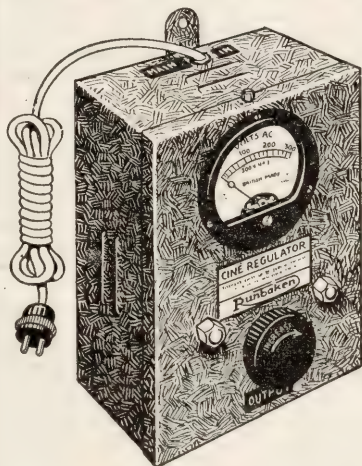
Fig. 7. Circuit of Rectified Current supply (For values see text.)

The gauge of wire for the new winding depends upon the current it is to carry. For $\frac{1}{2}$ or 1 amp., 3 ozs. of gauge 22 enamelled copper will suffice. For 2 amps, 4 ozs. of g. 20. For 4 amps., 6 ozs. of g. 18. These quantities will be found to fill the bobbin almost completely, giving about 250, 200 and 150 turns, respectively. Cover the winding with a layer of insulating tape to protect the enamel from damage during the re-insertion of the core. This is not re-assembled in the original fashion (unless the item was a choke in the first place), but instead the "E" shaped pieces are all inserted in the bobbin in one direction. Over their open ends a strip of cardboard about $\frac{1}{32}$ " thick is placed, and on top of this the "I" pieces are fixed—the cardboard forming a separator between the two groups of leaves. The whole assembly is then put back into its clamp, which must be screwed up or squeezed together very firmly, to avoid vibration in action.

The voltage required from the transformer depends upon several factors, but as a rough guide it will be fully double that of the lamp in the case of copper-oxide rectifiers, while for selenium type rather less serves—about 10 volts for a 6-volt lamp. The copper-oxide rectifiers give an increased output as they warm up, and one must allow five to ten minutes running before making final adjustment to the variable resistance. This last must be heavy enough to carry the current without overheating, and should be of about 5 ohms maximum resistance for 1 ampere lamp, or 1 ohm for 4 amps. (If a suitable instrument is not available, a satisfactory substitute is a piece of iron or heater-element wire wound round a scrap of hard asbestos—the length of wire must be determined by trial.) The voltage rise with copper-oxide rectifier may be as much as 15% above the "cold" figure. The selenium type appears to have a negligible temperature variation, and full output is obtained immediately. With either type,

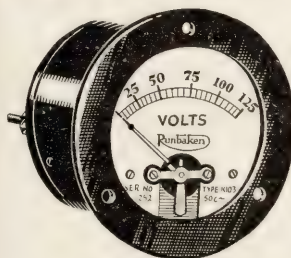
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the transformer should be designed to supply at least 50% greater amperage than required by the lamp.

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High-Frequency Oscillator

There remains the system which is increasingly used in commercial sub-standard projectors—the valve oscillator feed. This lends itself particularly well where compactness is a prime consideration, and has the advantage of being easy for the amateur to construct from readily available materials. A simplified version of this feed was given in T.I.D. of June, '42, a loudspeaker transformer forming the basis. Better efficiency and reliability are gained by using a specially-wound transformer—the simplicity of which will be evident from the details which follow. The design of this item was the subject of considerable experiment, and the final dimensions are the result of a number of trial constructions. Although the transformer is small, its efficiency has not suffered. The most critical characteristic is the ratio of the windings, and it was unexpectedly found that this was identical for a wide variety of valves. Also, although H.F. feed is usually restricted to 3-watt exciters, it was found possible to provide ample power for a 6-watt lamp, yet using a valve of nominally less than 10 watt dissipation, and therefore obtainable without a G.P.O. permit. (Incidentally, the security ban on such oscillators only applies to those having an *output* of 10 watts or more, so that no qualms need be felt by the experimenter in this case.) However, the H.T. voltage required for this 6-watt output is possibly higher than that found in many amplifiers (see Fig. 5). Three types of lamp are provided for: 6 volt, 3 watt—such as the festoon bulb, or the Baby Pathe lamp for accumulator use; 4 volt, 0.75 amp.—such as the Bell-Howell exciter; and 6 volt, 6 watt—the standard small exciter. (By a fortunate coincidence, the same transformer ratio suits both the last two.) The circuit is shown in Fig. 6, and will be seen to consist of a pentode output valve, an air-cored transformer with three separate windings, screen and cathode resistors, and a control potentiometer. The values of some of these components are determined by the type of valve, and are given in the table adjoining (Fig. 5). Normally, the heater and H.T. supplies are tapped off the amplifier power-pack, and most outfits will meet this extra load. (If the existing

rectifier valve is already fully loaded, an extra rectifier can sometimes be fitted, and its output fed through a simple smoothing system to the oscillator. This has the added advantage of not affecting existing voltages in the amplifier, but is only practicable where the mains transformer has sufficient reserve.)

The voltages and resistance values listed may have to be varied a little in individual cases, but as they stand form a useful indication of the output one may expect. This is important, since the output cannot be directly measured with the usual types of instrument.

Although the frequency is too high to be audible—or perhaps *because* it is—screening is important between oscillator and amplifier, especially the early stages. A small ventilated metal box to contain valve and components, and a screened lead to the exciter usually provide ample protection against interference.

It is most convenient for the shaft of the potentiometer to be brought out somewhere near the volume control of the amplifier, and desirable to run the oscillator full on only when necessary. Within wide limits it is satisfactory to use the potentiometer as the volume control. Maximum brilliance of the exciter occurs with the potentiometer near its full-on position, and falls off beyond this point. The condenser "C" is not essential, but desirable to prevent excessively high voltages in the circuit. It should be of about 50 pf. (.00005 mfd.) capacity, of the mica type, and tested to at least 1,000 volts.

Winding the Transformer

As will have been gathered from the foregoing paragraph, high voltages are generated across the transformer. On full load, potentials of 500-600 volts may occur—even with so little as 100 volts H.T. supply. This means that care must be taken over insulation of the windings. For the primary coil, silk-covered enamelled wire is to be preferred, if it is obtainable, but ordinary enamelled wire will serve satisfactorily. 2 ozs. of gauge 36 will be ample, while for the output winding 1 oz. of gauge 22 is more than enough. The turns are not so numerous that hand-winding is laborious, but a simple winder—e.g., based on a hand-drill held in a vice—will save time, and should also give more even winding. The coil-former is nothing more than an empty cotton-reel of the deep variety, measuring approximately $1\frac{1}{4}$ " in diameter by $1\frac{1}{2}$ " long, and with end-walls sloping down to a core about $\frac{3}{4}$ " diameter. On this is first wound a layer of insulating tape (Empire Cloth, if available, is certainly more "professional," but much less adaptable). Next, a small hole is drilled in one wall, through which one end of the

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gauge 36 wire is led out. Preferably, a heavier wire is soldered to the thin wire to serve as lead. This wire should not rest directly on the wood, but should pass through thin (2mm.) systoflex sleeving, which should also enclose the soldered joint, and any of the thin wire bared for soldering. The winding now begins, and the wire is laid down as evenly as possible, being kept at least $\frac{1}{8}$ " away from the sides of the bobbin—the first layer will be rather less than $\frac{3}{4}$ " wide. Winding is continued until 300 turns have been made, and then another layer of insulating tape is wrapped on, the wire being brought through the tape in the centre of the reel—not at the side. A further 300 turns is wound on, and again insulating tape. This is repeated until a total of 1,500 turns are on, and the out-lead, similar to the first, led out through systoflex as before. The primary ("P") winding is now complete, and is covered with three thicknesses of tape. Next, the Grid ("G") coil is wound. Its leads can be taken down inside the bobbin if desired, instead of through the wall. It consists of 250 turns of the same gauge 36 wire, with only one intermediate layer of tape at 125 turns. Over this winding two thicknesses of tape are wound on, and it is ready for the output ("L") winding. The number of turns depend upon the lamp to be used: for the "A" ratio (Fig. 5), 36 turns are required, while for "B" only 24 are needed. The 22-gauge wire used for this winding is sufficiently heavy to act as its own leads, but systoflex should be used to protect the enamel at the points of entry and exit. A final winding of tape completes the process.

The leads of the primary winding should be kept far apart from the other two, and the transformer may be fixed in place by a brass screw through the centre hole. If a paxolin or ebonite tube of suitable diameter is available, it will make a neat protective cover, but a close-fitting metal casing must not be used. If the oscillator does not function when first switched on (after allowing the valve to heat up, of course), then reverse the leads of the "G" coil.

It will be noted that octal-type valves are listed in the chart, but most types of mains output pentode may be used. Thus, practically interchangeable with the 6-volt 6F6 (Osram KT63) are the American 42, the 4-volt Mullard Pen4VA and Mazda AC2Pen. The 0.3 amp. 25A6 (Osram KT35) is closely similar to the Mullard 0.2 amp. Pen26. The heavy H.T. current required by the 25L6 makes it unsuitable for driving from the main amplifier power-pack, but it can be usefully employed where low-voltage mains are encountered, and AC/DC operation is required.

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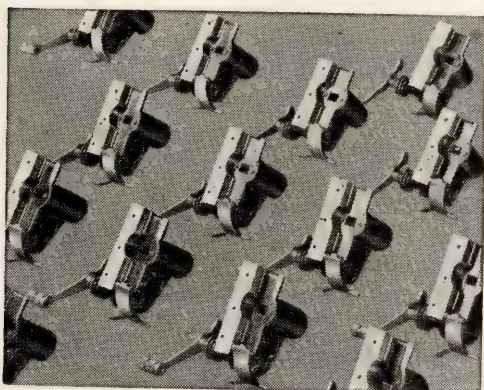
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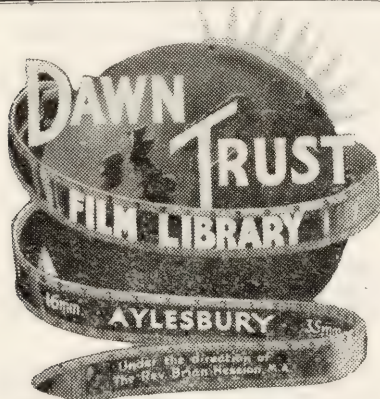
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A.B.G.—Film can be tinted with proprietary dyes such as Johnson's Photo Dyes, or Burroughes Wellcome "Soloid" Stains. The correct concentration can be found by experiment. Newly processed film can be immersed directly under the prepared solution. Film that has been processed for some time, or which has been projected, and appears to be dry, should be soaked thoroughly.

If there is any suspicion of finger marks or oil marks, clean the film with "Thawpit" or one of the other preparations of carbon tetrachloride sold as cleaners, or preferably with Johnson's Film Cleaner.

Density of colour depends on the concentration of the dye, and not so much on the period of immersion in the dye. You can use a fairly weak solution first, and if this is not deep enough in result, employ a more concentrated one. In hot weather it may be necessary to dry the film after soaking and between the two immersions, otherwise the emulsion may become unduly softened. Hardening of the film in processing will not prevent it from dyeing.

REVERSE MOTION IN 8mm. FILM

A.C.2 A.D.—As explained in "Trick Effects with a Cine Camera" if a camera is held upside down, the pictures will also be upside down, so that when, after processing, the film is turned end-for-end, the pictures will be right way up, but will then run through the camera in the wrong order, the last one being shown first, and so on.

This cannot be done with 8mm., as there is solid film down one side and sprocket holes down one side only. If the film is turned end for end it is also reversed left and right, and so the solid side of the film will come on the claw side of the projector.

The only feasible plan, therefore, is to use a mirror or prism and take at right angles. This reverses the picture left-to-right on the film. (As the picture is normally upside down and reversed left-to-right in taking, the actual effect is that the picture is upside down, but the left side of the image remains on the left of the film.) The film is then inverted by turning it upwards, just like turning up the pages of a shorthand note book, and is then found to be with its sprocket holes on the same side as the rest of the film, but with the emulsion (dull) side on the opposite side to the rest of the film. The movement will show in reverse motion.

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It's so easy to buy but hard to sell. If you wish to buy good 16mm. Sound Films or if you have good ones for sale and want a very good offer, please write me at my new temporary address. I will be especially pleased to hear from customer friends who used to call in London.

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